Seam Welding Robot
Standard Specification

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NACHI-FUJIKOSHI CORP.

ROBOT DIVISION

1001,SSWEN-031-001,001

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1. Preface

1.1 Important notice

In order to use robot safely, carefully read through robot maintenance service manual before installation, operation, maintenance or inspection.

Use the robot after familiarizing with the equipment knowledge, safety information and safety related all important notice.

2. Outline

1. Small and light weight seam welding gun

Small and light weight seam welder which robot can handle is developed. When robot carries a seam welder, it is applicable to the work piece shape which conventional stationary seam welder can not cover.

2. High speed welding

Relatively high speed welding to other welding method is available.*1 Following table shows the reference data of welding 2 lapped sheets of cold rolled metal (thickness 0.8mm). Welding test facility is available for customer's work piece.

*1 Welding condition may differ according to thickness, material or other various factors.

Table 2.1 Reference data

Test piece	Material		SPCC（Cold rolled metal）
	Thickness	Upper	0.8mm
		Lower	0.8mm
Electrode shape	Upper electrode(movable)		t10×φ110×R8
	Lower electrode(fixed)		t10×φ110×R8
Seam welding condition	Welding current		14000A
	Heat＆Cool cycle		5msec:3msec
	Welding speed		20m/min
	Clamping pressure		220kg

3. Seam welding function

Following seam welding function is equipped.

- Simultaneous movement between robot motion and electrode rotation
- Automatic adjustment of electrode abrasion amount
- Dressing function
- Electrode rotation speed adjust according to work piece thickness

3. Standard configuration of seam welding robot

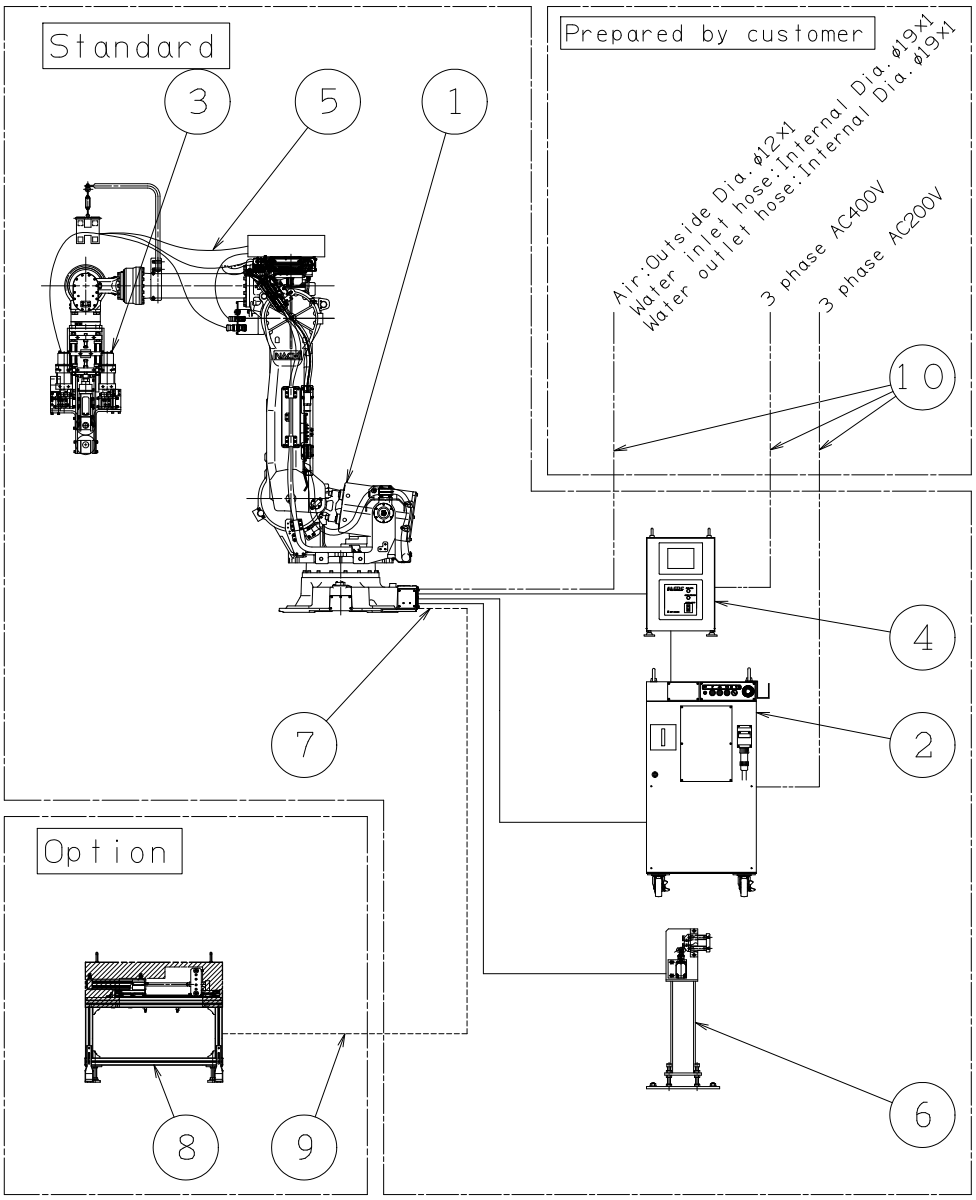


Fig. 3.1 Seam welding system

Table 3.1 Parts

No.	Parts(Type)
①	Robot (ST210F-01)
②	Controller (AX20-1101) *2
③	Seam welder (RS-0910510)
④	Welding controller (AH-FFHC)
⑤	Attachment (Air and cooling water parts)

No.	Parts(Type)
⑥	Limit switch detecting electrode abrasion amount (E0516298D2)
⑦	Cables
⑧	Electrode grinder *1
⑨	Cable for electrode grinder *1
⑩	Primary power, water, air is not included.

*1 : Optional

*2 : The model changes by the destination. Please inquire of our business about details.

4. Specification

4.1 Robot

※ Relating to robot Standard specifications, please refer to the specification sheet of ST210f-01.

4.2 Controller

Table 4.1 AX20controller

Item	Specification
Name	AX20 controller
Application	Seam welding
No. of control axes	8 axes
Standard function	Seam welding, soft PLC, user I/F, Oscilloscope function, Endless rotation function

※ Relating to AX20 Standard controller specifications, please refer to the specification sheet of AX20 controller .

4.3 Seam welder

Table 4.2 Seam welder

Item			Specification
型式			RS-0910510
Welding	Rated capacity		90×2kVA
	Max. welding current		15000A（Under following duty used）
	Duty		67%
	Welding transformer		AH-MFT transformer[AH-MF-B90]
	No. of transformer		2
Clamping	Drive methode		Pneumatic cylinder
	Max. clamping pressure		300kg/0.5MPa
	Clamping pressure adjust		Manual setting by air regulator (Option：Electro-pneumatic Proportional valve)
Electrode	Diameter	Max.	φ110mm（Both upper and lower）
		Min.	φ100mm（Both upper and lower）
	Thickness		t10mm（Both upper and lower）
	Shape of section face		R8 circular（Both upper and lower）
Electrode stroke			25mm（in case both electrode dia. φ110）
			35mm（in case both electrode dia. φ110
Cooling water	Total amount		28[L/min]
	Transformer		12[L/min]
	Upper current supply unit		4[L/min]
	Lower current supply unit		4[L/min]
	Upper electrode		2[L/min]
	Lower electrode		2[L/min]
	Cable,conductor		4[L/min]
Seam welder weight			175kg

4.4 Welding controller

Table 4.3 Welding controller

Item		Specification
Welding control	Type	AH-FFHC(SEAM)
	Current control	Peak value control
	No. of welding condition	15
	Max. current	650A
Dimensions	Width W×Height H× Depth D	300[mm]×475[mm]×627[mm]
Cooling water		5[L/min]
Weight		Approx.54kg

4.5 Power resources

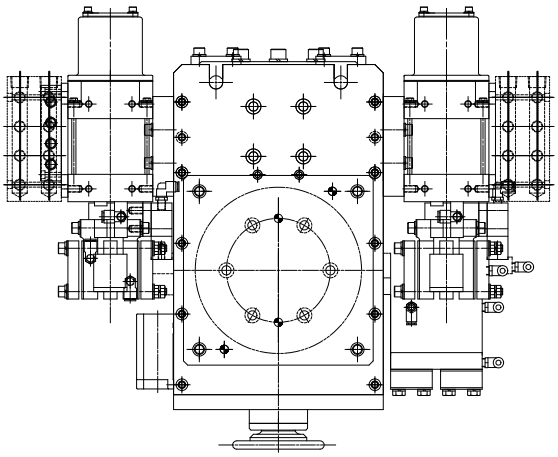
Table 4.4 Primary power resources

Cooling water	Water temperature	5～30℃
	Connection	In：Hose internal dia. φ19（volute nipple） Out：Hose internal dia. φ19(volute nipple）
Air	Pressure	0.5MPa
	Connection	Hose external dia. φ12（onetouch joint）
Primary electric power	MF welding controller（AH-FFHC）	3 phase 400V（380～440V）50/60Hz
	Robot controller（AX20）	200V/220V±10％（3 phase50/60Hz）
Electric capacity	MF welding controller（AH-FFHC）	300kVA（in case duty＝70％） 200kVA（in case duty＝30％）
	Robot controller（AX20）	8.5kVA

5. External view and circuit diagram

5.1 Seam welder

Type：【RS-0910510】



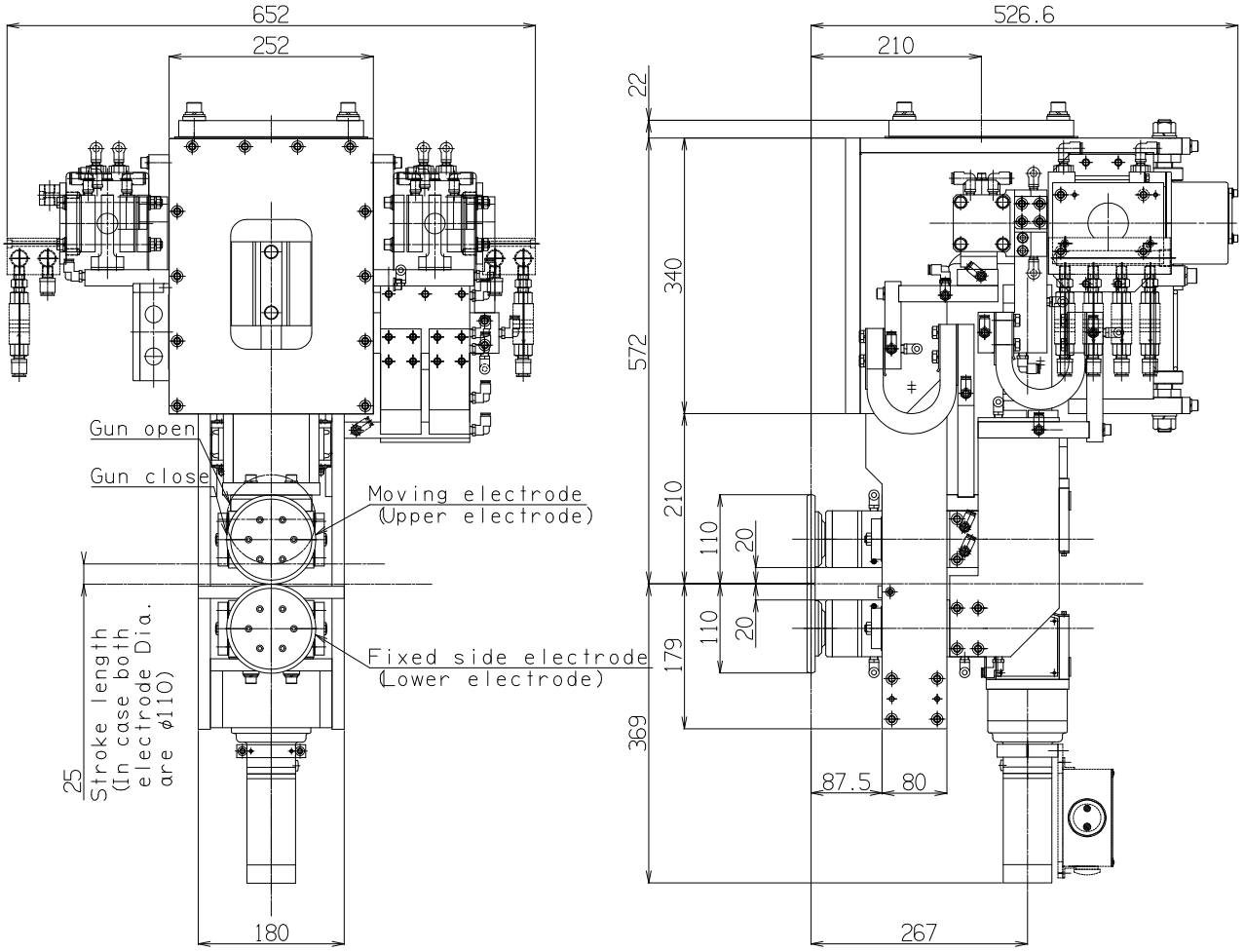


Fig 5.1 Seam welder

5.2 Welding controller

Type：【AH-FFHC】

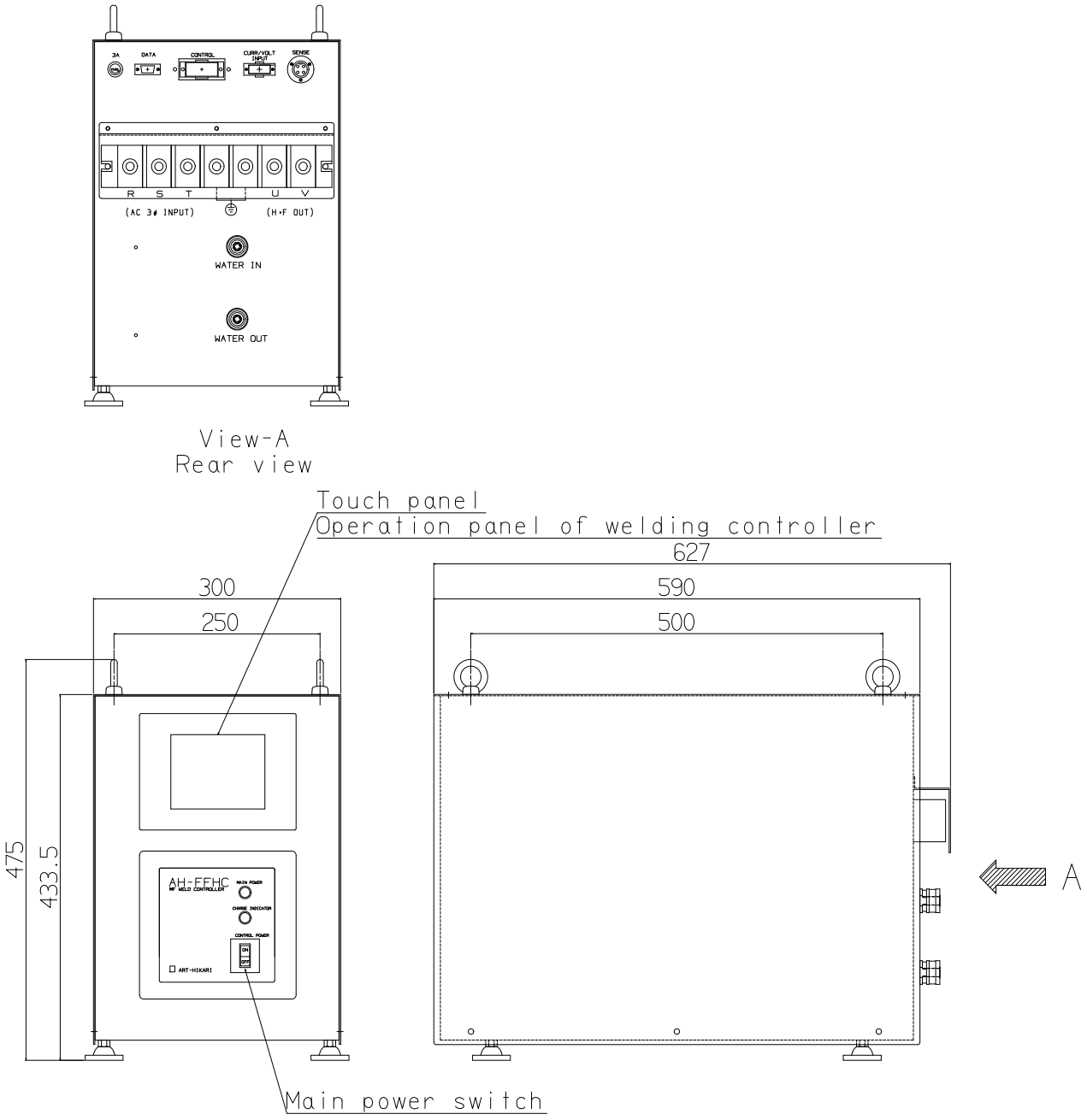


Fig. 5.2 Welding controller

5.3 Electrode abrasion amount detector

Type：【E0516298D2】

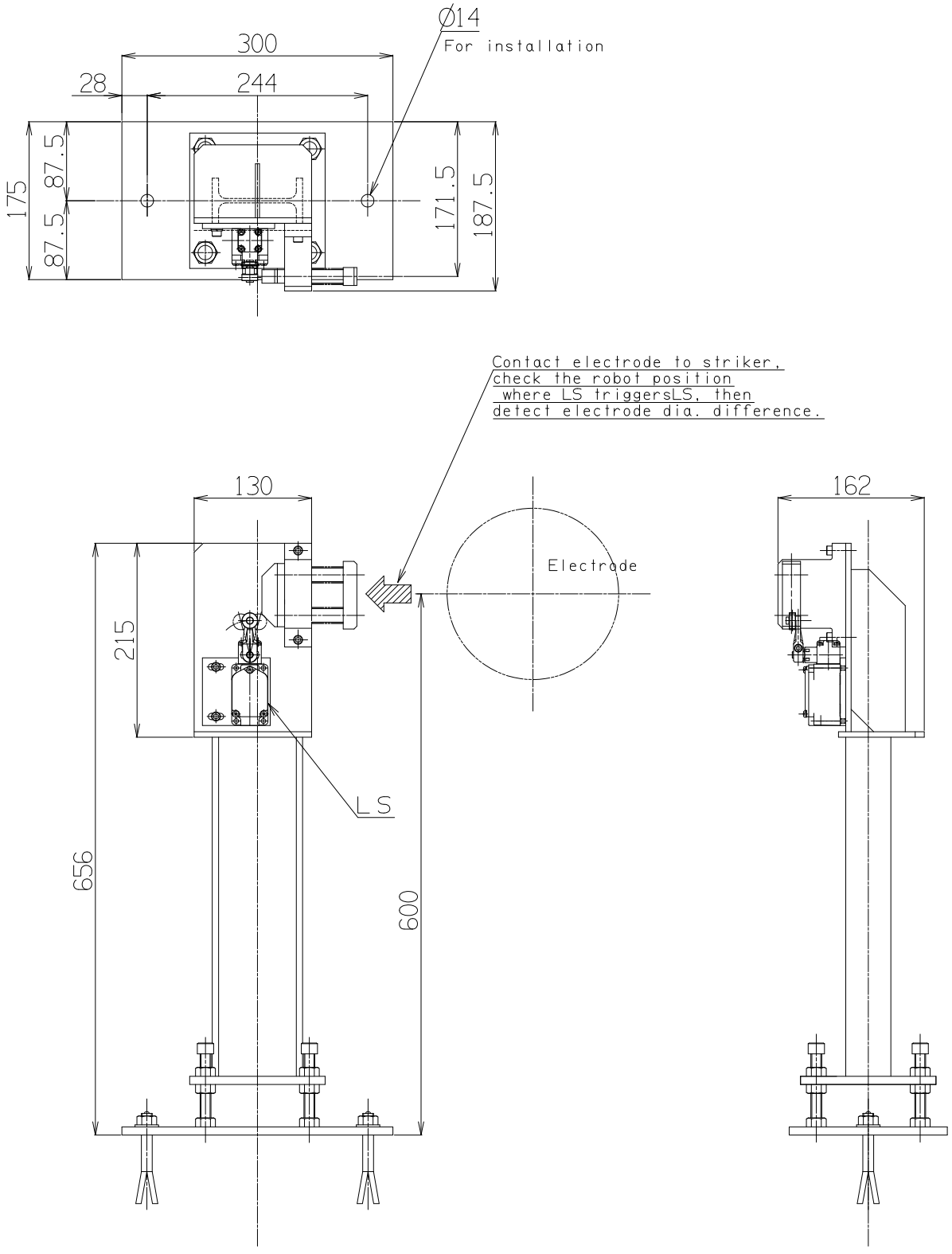


Fig. 5.3 Electrode abrasion amount detector

5.4 Electrode grinder (Option)

Type：【090990】

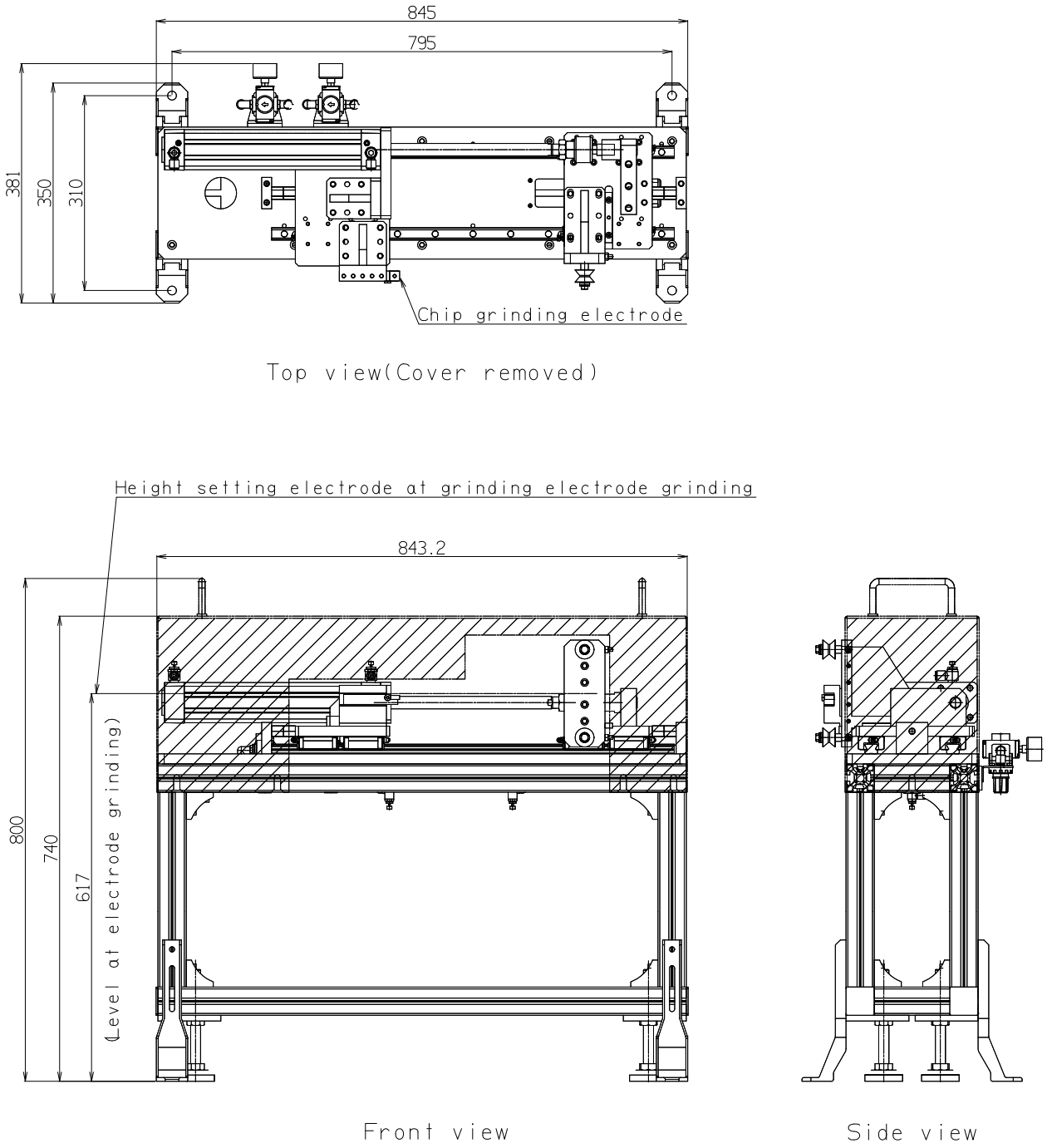
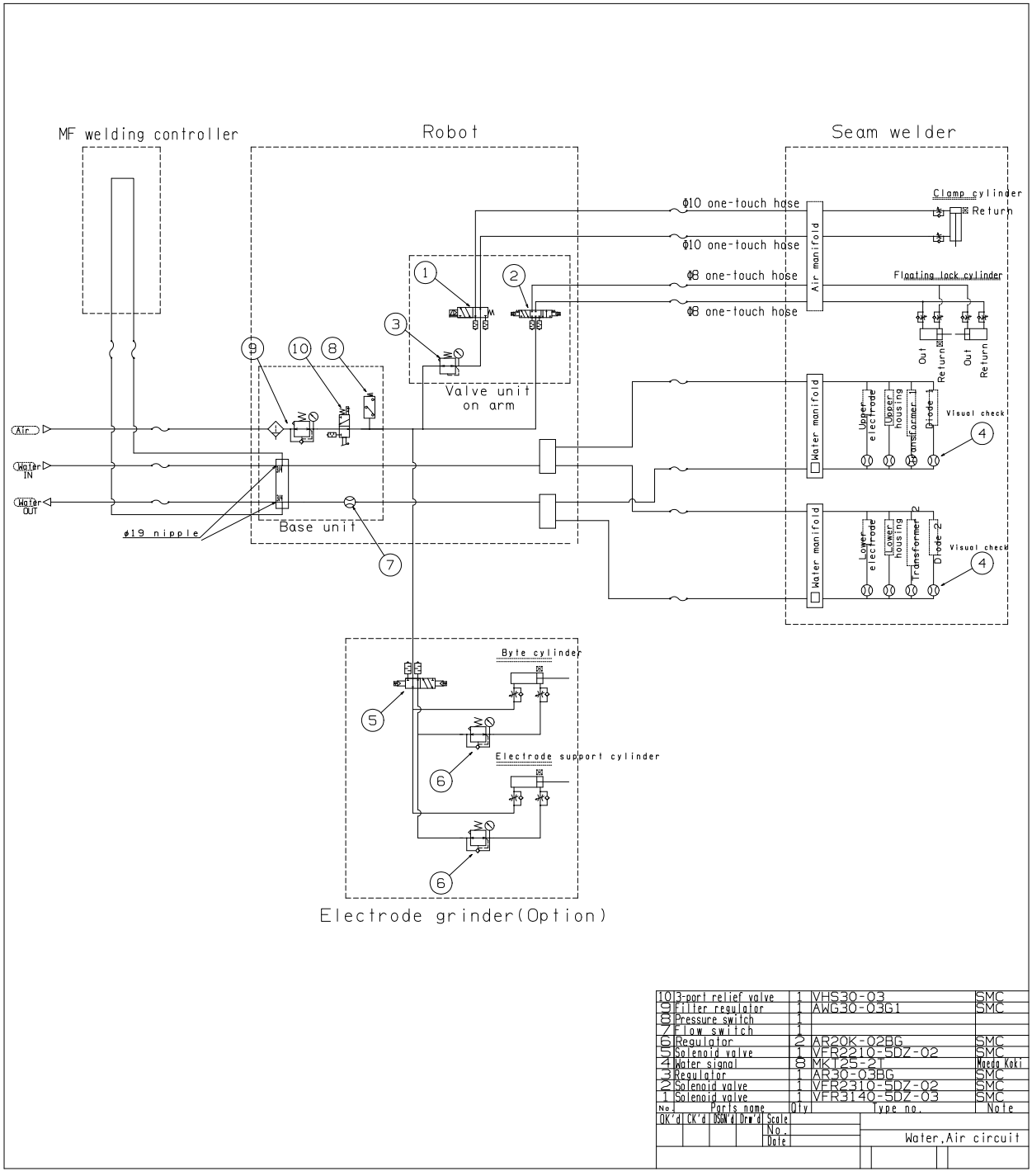


Fig. 5.4 Electrode grinder

5.5 Cooling water and air



No.	Parts name	Qty	Type no.	Note
10	3-port relief valve	1	VHS30-03	SMC
9	Filter regulator	1	AWG30-03G1	SMC
8	Pressure switch	1		
7	Flow switch	1		
6	Regulator	2	AR20K-02BG	SMC
5	Solenoid valve	1	VFR2210-5DZ-02	SMC
4	Water signal	8	MKT25-2T	Maeda Koki
3	Regulator	1	AR30-03BG	SMC
2	Solenoid valve	1	VFR2310-5DZ-02	SMC
1	Solenoid valve	1	VFR3140-5DZ-03	SMC

OK'd	CK'd	DSN'd	Drw'd	Scale	
				No.	
				Date	

Water,Air circuit

Fig. 5.5 Cooling water and air circuit

6. Consumable parts

6.1 Seam welder consumable parts

Table 6.1 Consumable parts list

Item	Replacement interval and checking method
Electrode	Visual check
Current supply unit	Once in a year
Shunt conductor	Visual check（breaks）
Grease	Once in a year

7. Delivery condition

No.	Item	Include	Exclude	Remarks
1	Delivery ex your company	○		Packing and shipping(Allocation of truck is covered by customer.)
2	Delivery ex the place where robot is installed		○	
3	Delivery ex specified port		○	
4	Export packing		○	
5	Connection work of primary water supply		○	To robot connection port
6	Connection work of primary electric supply and ground wiring		○	To controller
7	Connection work of primary air supply		○	
8	Reconstruction of peripheral equipment for installing the robot system		○	Removing interfering equipment
9	Foundation work		○	
10	System operation trial including installed peripheral equipment at customer site		○	When the relation between the robot system and the peripheral equipment becomes clear, estimate will be made.
11	Interlock signal connection work to peripheral equipment		○	
12	Special operation training at customer site persons × days		○	Additional estimate is required for longer training.
13	Special maintenance training at customer site persons × days		○	
14	Teaching persons × days	○		1 program only
15	Installation work		○	
16	Startup monitoring persons × days		○	
17	Testing persons × days	○		At NACHI factory。 Note 1
18	Application analysis persons × days		○	

Note 1：In case work piece is supplied.

8. Warranty period

（1） One year after delivery

Please consult with NACHI's local sales organization near you about periodic inspection or maintenance after warranty period. Relating to the interval information, please refer to the maintenance service manual.

・The specification or external view in this specification sheet may be altered without notice for improvement.